Space Weather Forecast

Issued on Sunday, 16 April 2023 at 12:29 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

---

Space Weather Forecast Headline: Chance of Moderate-class X-ray flares (R1-R2 Minor-Moderate radio blackouts), slight chance of Strong-Class flares (R3 strong radio blackouts) throughout. Slight chance of Minor Geomagnetic Storms on 19 Apr due to possible CMEs.

Analysis of Space Weather Activity over past 24 hours
Solar Activity: Solar activity has been Low, with only Common-class flares observed. There are 11 classified sunspot regions on the visible disc with four of these considered to be notable. Two in the southeast quadrant, neighbouring each other appear to be passing through phases of strengthening and weakening, with one weakening as the other strengthens. A large region in the northeast has stabilised after earlier rapid development. A further region just in the southwest quadrant also appears to have stabilised. All these regions carry relatively complex magnetic configurations and are the source of much of the recent Common-class flares. The remaining regions are all benign and weak.

Three potentially significant CMEs have been observed on satellite imagery. A plasma filament lift off to the northwest early on 15 Apr produced a CME which may glance the Earth on 19 Apr. A filament lift off to the southwest also appears to have missed. A near full halo CME has been analysed, with the outcome of Enlil modelling still being awaited. Based on the analysed speed, this could arrive at Earth on 19 Apr.

Solar Wind / Geomagnetic Activity: The solar wind has been at background levels throughout the period. Total magnetic field strength has been weak, with the north-south component also varying weakly. Geomagnetic activity was Quiet to Unsettled throughout the period.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary
Solar Activity: Solar activity is expected to be mainly Low, with a likelihood of Moderate activity through the next four days. There is a slight chance of Strong activity.

Solar Wind / Geomagnetic Activity: A CME which left the Sun on 12 Apr was due to arrive early on 16 Apr, with decreasing confidence in a potential arrival. Two CMEs observed during 15 Apr have been analysed with one from the northwest potentially glancing the Earth on 19 Apr. A near full halo has been analysed and although results are awaited, the potential speed of the CME suggests an arrival on 19 Apr. No fast solar winds are forecast to connect, with the fast winds from coronal holes 92 and 93 expected to have missed the Earth. Geomagnetic activity is forecast to be mainly Quiet to Unsettled, with a current slight chance of G1/Minor Storm intervals on 19 Apr.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2023. All Rights Reserved.

Met Office Space Weather Forecast

Energetic Particles / Solar Radiation: Solar radiation storms are not expected and should remain at background levels, although there is a slight chance of a greater than S1 event as some of the more complex active regions transit towards the western solar hemisphere, where they are more likely to connect with the Earth.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	5	1	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	60	60	60	60
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	10	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2023. All Rights Reserved.